Storm Flow and Sediment Loading at Fort Hood, Texas

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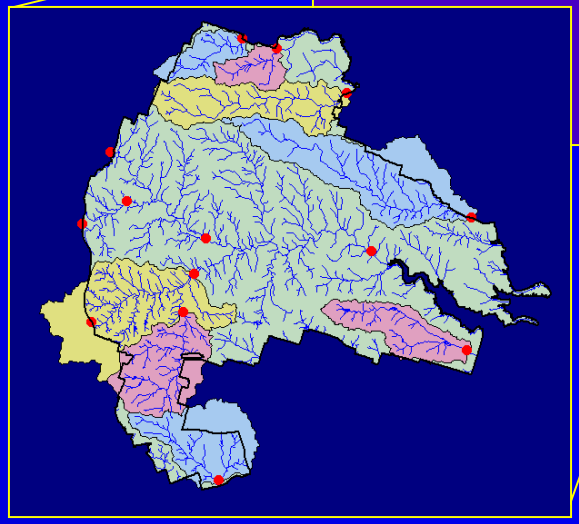
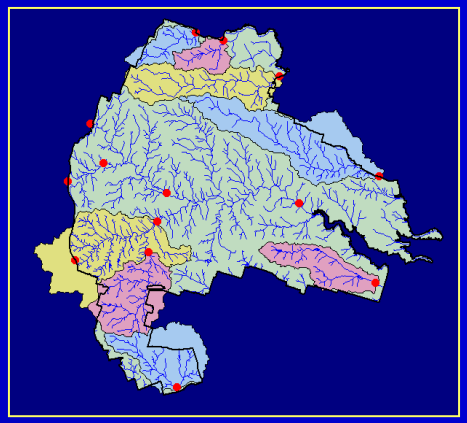
The Agriculture Program
THE TEXAS A&M UNIVERSITY SYSTEM

The Water Science Laboratory
Blackland Research Center
Temple, Texas





Project Team

- Dennis Hoffman –TAES, Project Leader
- June Wolfe – TAES, Project Manager
- Ralph Hicks – TAES, Technical Support
- Don Jones - ITAM, Technical Support
- Dennis Herbert – DPW, Project Coordinator
- Fred Schrank – NRCS, BMP Coordinator

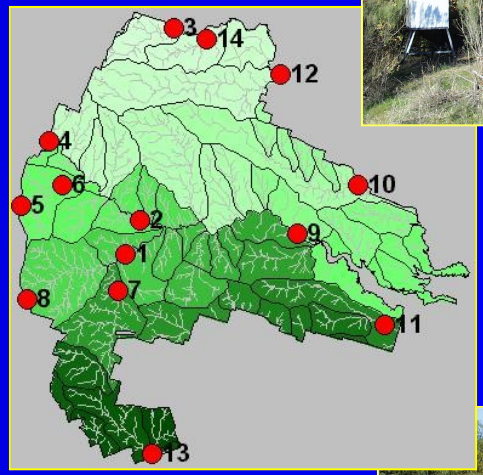
Project Description

Providing land management evaluation

based on water quality

Monitoring Sites

- **Fourteen Locations**
  - **Thirteen instrumented locations**
    - **Storm samples**
    - **Grab samples**
  - **One non-instrumented location**
    - **Grab samples only (site prone to flooding)**

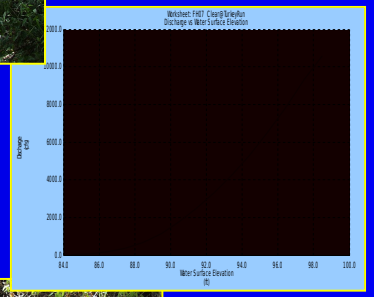


Precipitation and Stream Flow Monitoring

- Stream monitoring
  - ISCO 4230 bubble flow meter
- Storm sampling equipment
  - ISCO 3700 auto sampler
- Precipitation monitoring
  - Rain gauge - Texas Electronics TRP-525

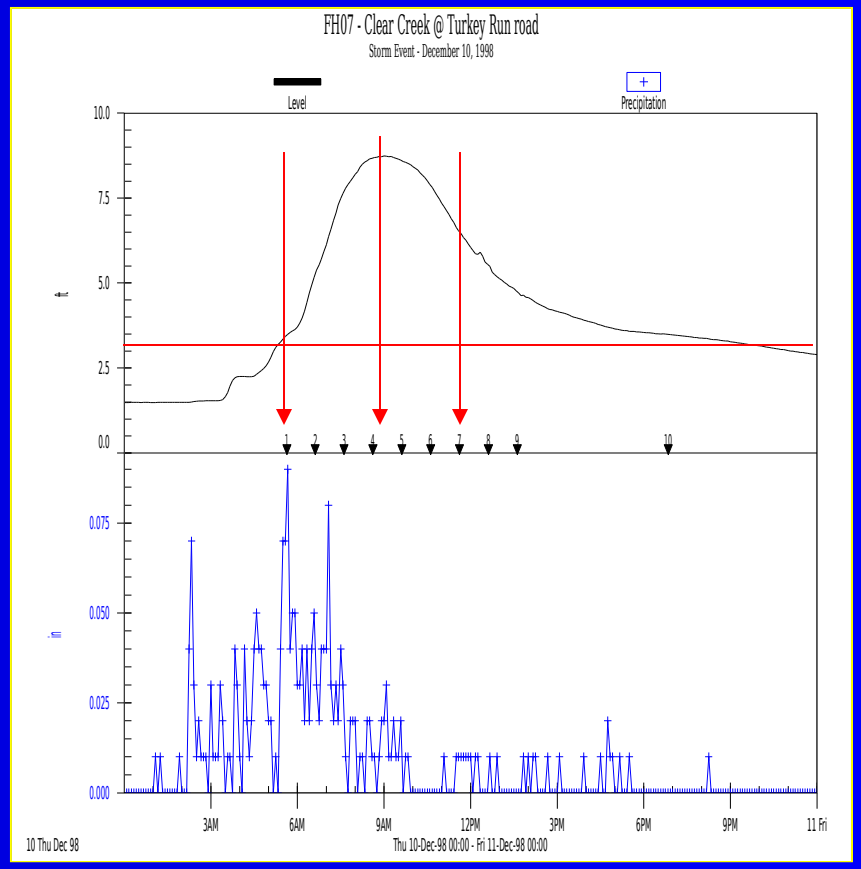
Stream Flow Determination

- Site survey
  - Cross-section
  - Stream slope
  - Channel roughness
- Manning formula
  - level to flow
  - flow to volume



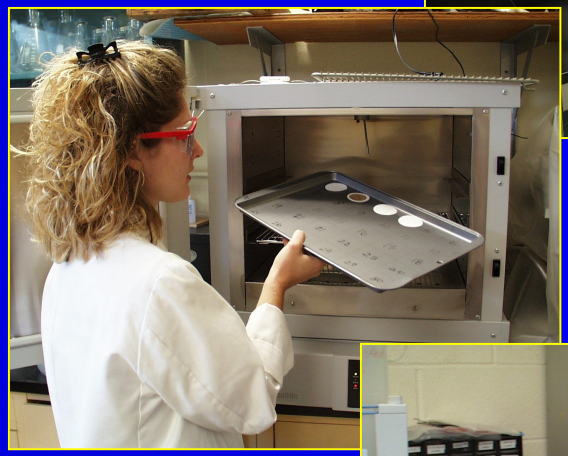
Storm Runoff Sampling Technique

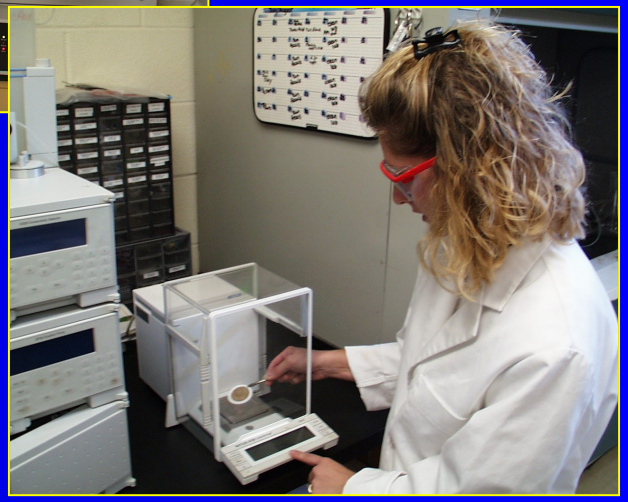
- **ISCO 4230 Flow Meter**
  - **Stream flow history**
  - **Precipitation history**
  - **Sample history**
- **ISCO 3700 Sampler**
  - **Time based sampling**
  - **Three samples analyzed per event**



Laboratory Analysis

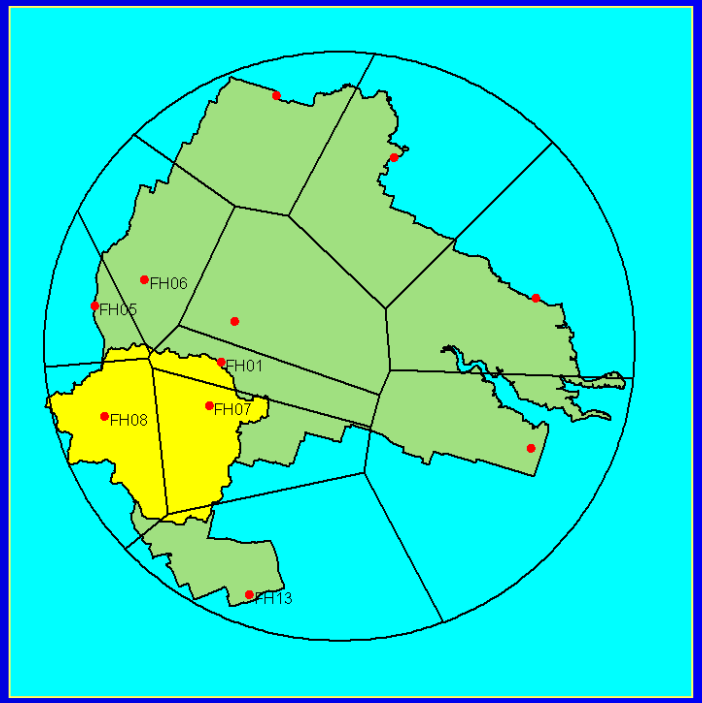
- **Sediment analysis**
  - **Total Suspended Solids (TSS)**
  - **Gravimetric measurement**
  - **Combined with flow volume to estimate loading**





Rainfall Determination using Thiessen Method

- Thiessen polygons provide weighted average of rain gauges within basin
- Better rainfall estimates for individual watersheds



Comparison of Shoal and House Creek Watersheds

- House Creek watershed 80% larger than Shoal Creek

- House Creek 60% less runoff (avg. 25 events)

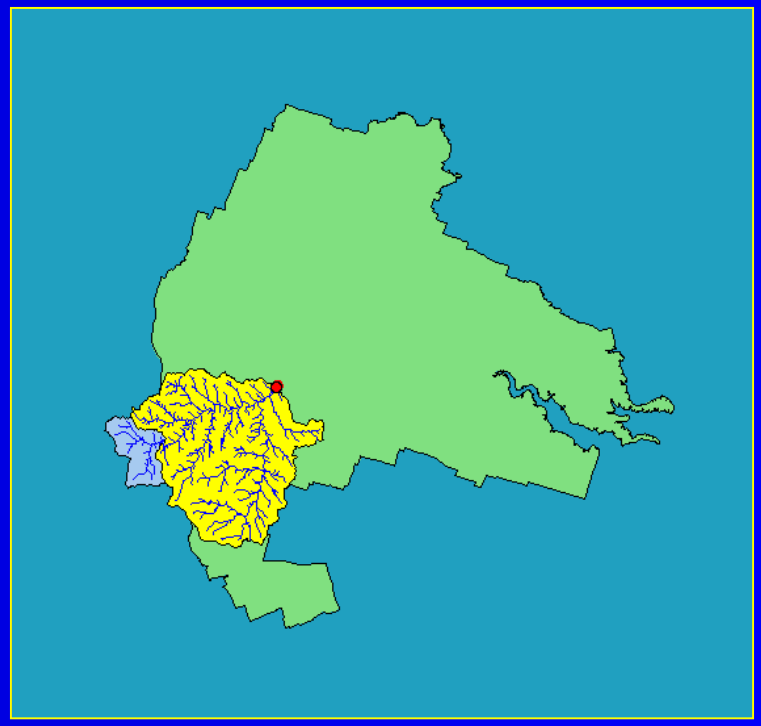
- House Creek 85% less sediment loss (avg. 25 events)

- More than 25 sediment retention structures in House Creek watershed

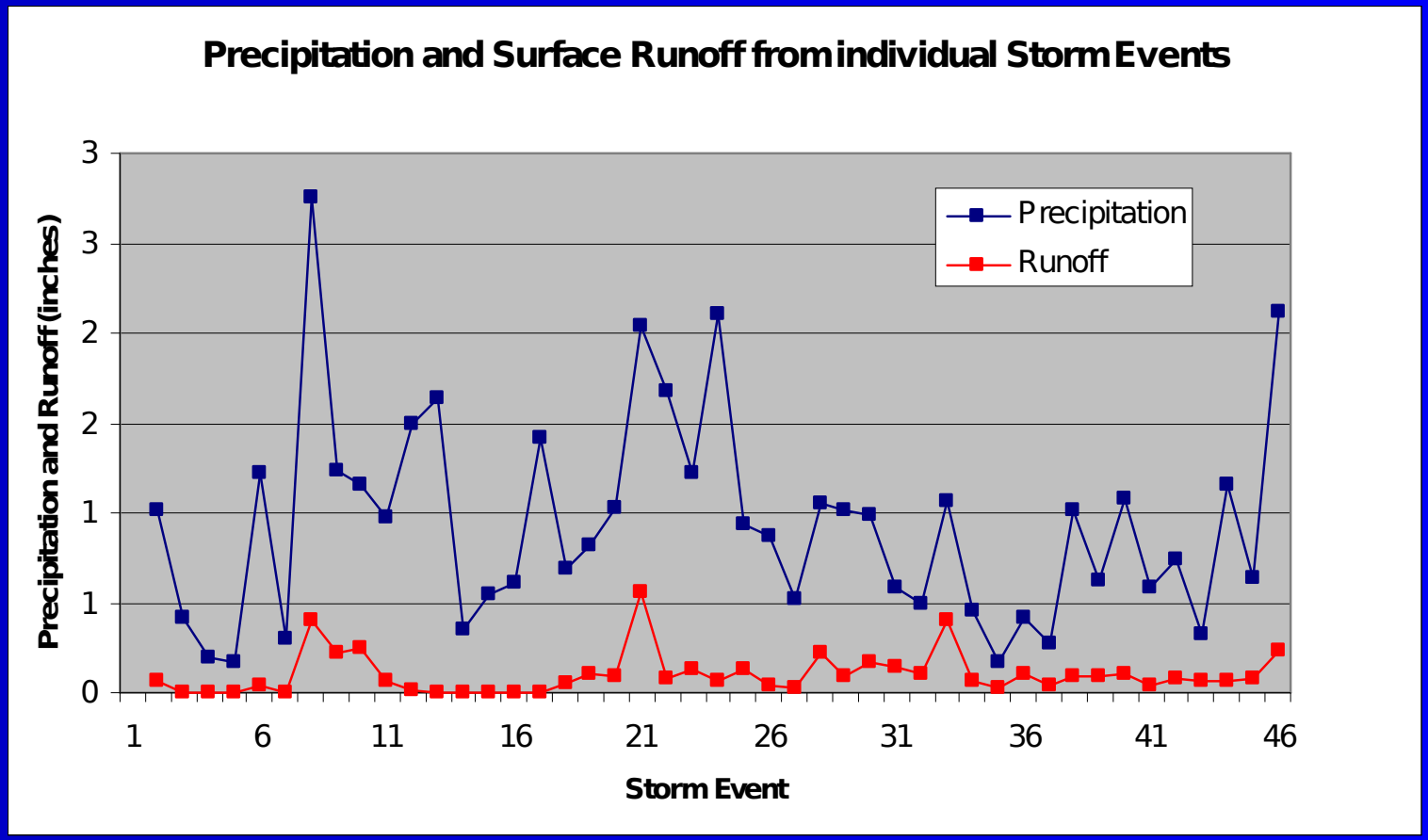
- No structures within Shoal Creek watershed

House Creek Watershed

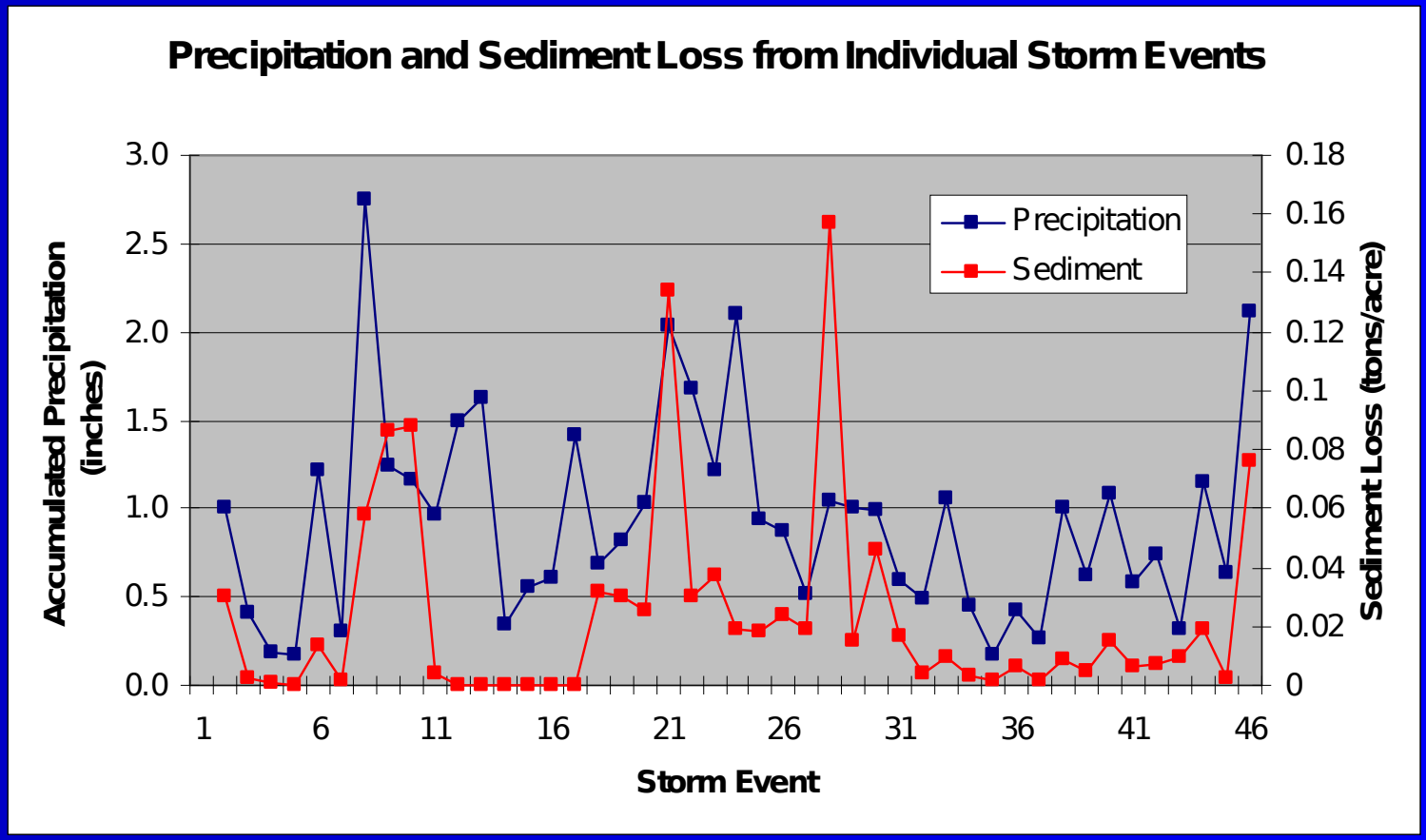
- 38200 Acres
- 28 training areas
- Perennial flow (wastewater treatment facility)



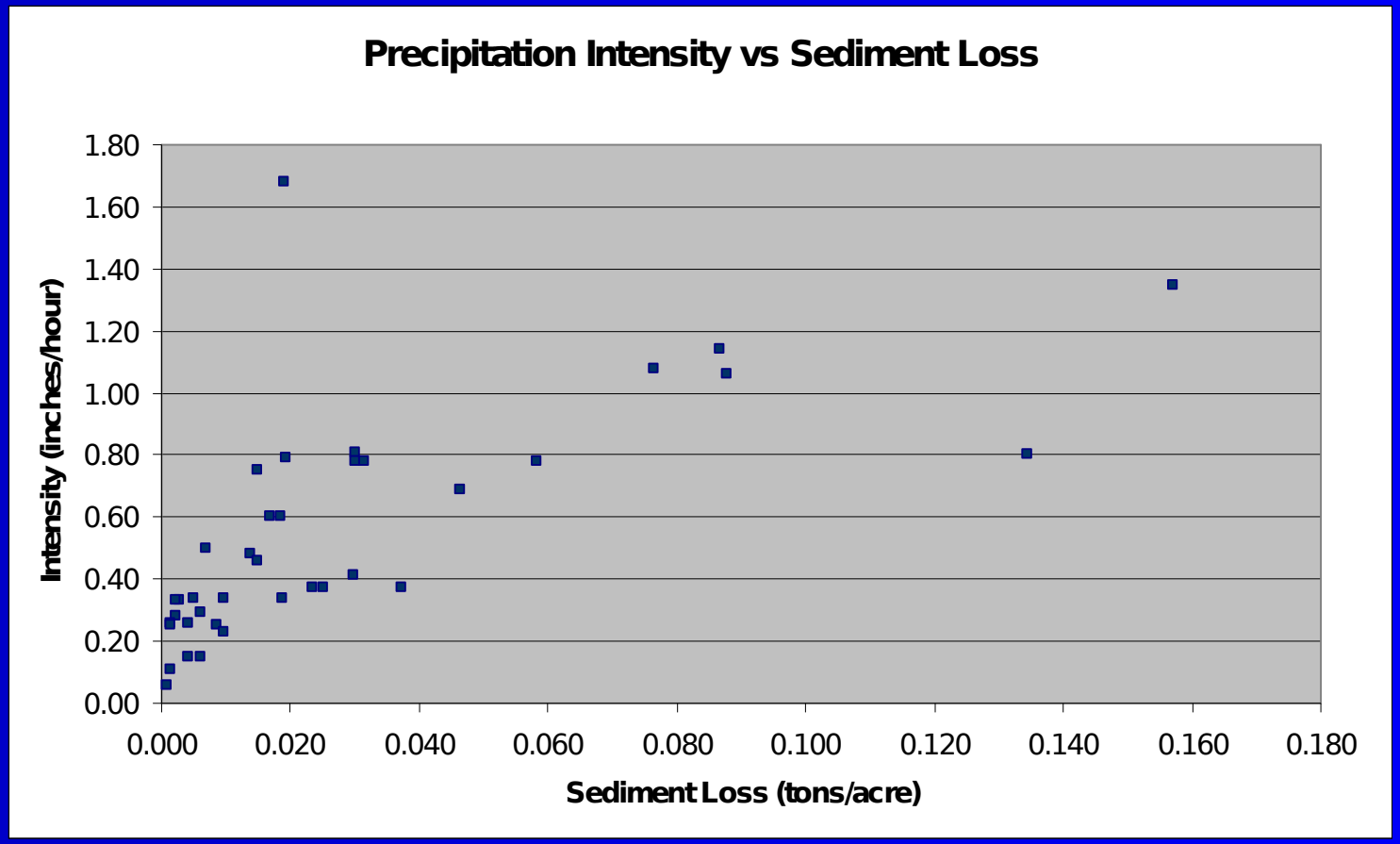
House Creek – Storm Runoff



House Creek – Sediment Loss

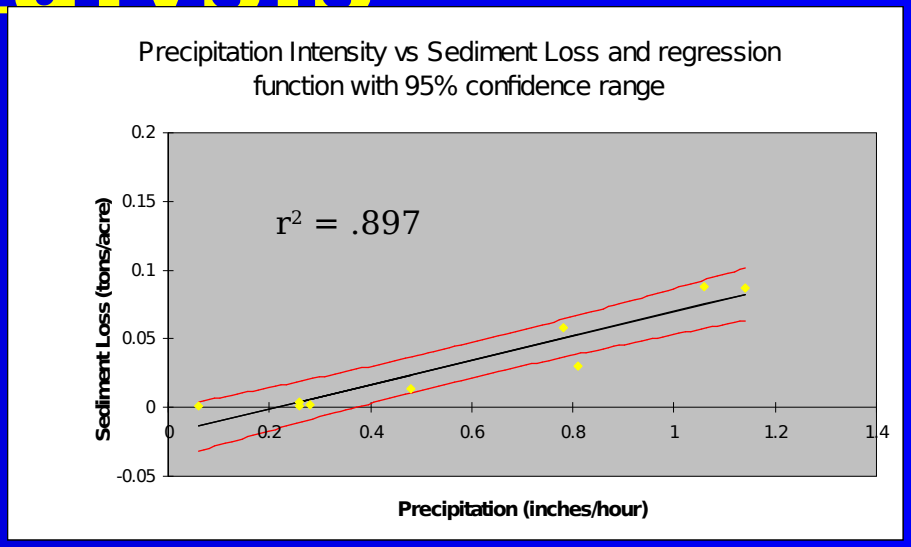


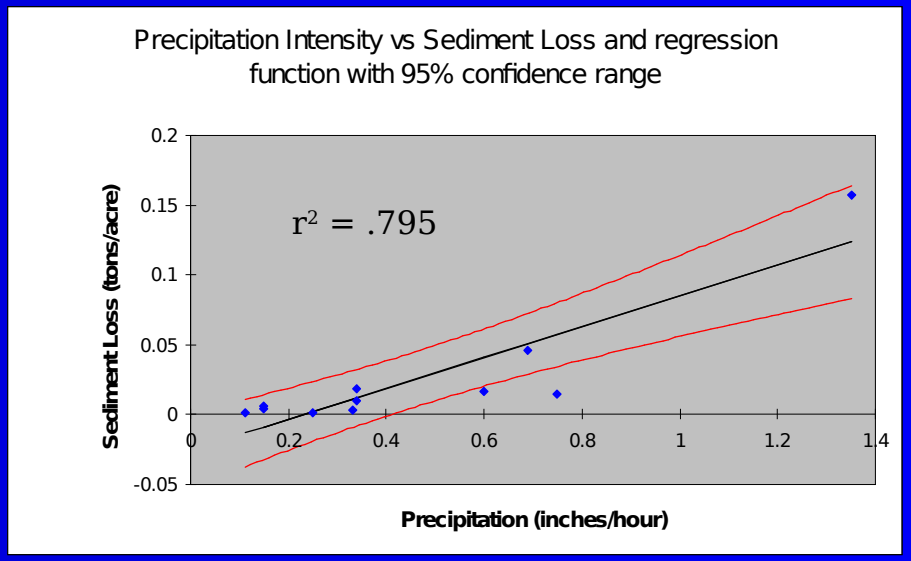
House Creek – Storm Intensity



House Creek – Trend Analysis

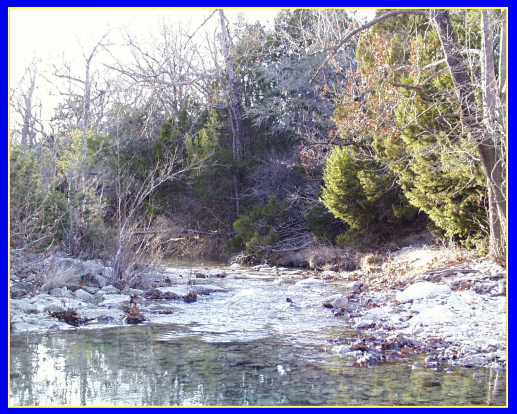
- Fall 1996 vs. fall 2000
- No significant difference in sediment loss over time despite continued





Trend Analysis Variables

- Soil conditions prior to storm event



- Vegetative cover prior to storm event

- Maneuver activity prior

: TARGET ACQUIRED

Future Activities

- **Continued monitoring**
- **Trend analysis**
  - **Individual watersheds**
  - **Individual storm events**
  - **Additional variables**
  - **Comparison between watersheds**

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Thank You

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